

Christopher Palmer

Personal information

Home Address

63 Cranbury Road, Princeton Junction, NJ 08550

Email

capalmer@cern.ch

Experimental Particle Physics.

Exploring extensions of the Standard Model via detailed studies of the Higgs boson.

Research Interests

Assistant Professor at University of Maryland - College Park

Distinguished Research at LHC Physics Center (LPC) at Fermilab. Associate research scholar under Princeton faculty Profs. Daniel Marlow and James Olsen.

Postdoctoral research associate under Princeton faculty Profs. Daniel Marlow and James Olsen.

Doctoral student of James Branson at UCSD (at CERN April 2010 to April 2013).

Professional History

March 1st, 2021 - Present

2020 and 2021
Oct 2016-Feb 2021

Oct 2014-Sept 2016

Aug 2009-August 2014

Convener of CMS's Higgs to bottom quarks sub-group (CMS L3)

Convener of the LHC Higgs Boson Cross Section sub-group on VH cross sections (LHC Higgs WG1 VH sub-WG)

Leader of the CMS VH \rightarrow $b\bar{b}$ analysis team

Convener of CMS luminosity physics object group. (CMS L2)

Research Positions

Sept 2018 - Sept 2020

Sept 2018 - Dec 2020

Sept 2017-Present

January 2016-December 2018

May 2015-Present

Sept 2014-Present

Sept 2014-Present

Jan 2011-August 2014

Leader of CMS forward hadronic calorimeter luminosity operations.

Analyst in the CMS H \rightarrow $b\bar{b}$ group

Analyst in CMS luminosity physics object group.

Analyst in the CMS H \rightarrow $\gamma\gamma$ group

Education

Sept 2007-June 2014

Aug 2003-May 2007

PhD in Experimental Particle Physics at University of California - San Diego.

Advisor: Professor James Branson, UCSD

Co-advisor: Dr. Marco Pieri, UCSD posted at CERN in Geneva.

BS in Astronomy and Mathematics University of Southern California - Los Angeles, CA

Teaching

Princeton University
Undergraduate Lab
Manager
Sept 2019 – Jan 2020

I was in charge of all written lab material for the introductory classical mechanics lab series for engineers and physicists. This lab sequence emphasizes laboratory techniques including computing statistical uncertainties, error propagation, using MATLAB, and thinking about/reducing systematic errors arising from flawed techniques. One of the labs has only been used a few times (understanding statistical error with geiger counters and common radioactive materials). The data was recorded and a paper is envisioned with departmental teaching faculty, Kasey Wagoner.

Princeton University
Lecturer
Feb 2019 – May 2019

I taught a small section of young engineers and physicists introductory electricity and magnetism. The class met three times per week for 50 minutes. In addition to reinforcing previously lectured material with examples, I wrote problems for some quizzes and exams as well as grading quizzes weekly.

UCSD Lecturer
July 2013 – Sept 2013

I wrote and delivered 3-4 lectures per week for two accelerated-pace classes lasting 5 weeks each. Utilizing demonstrations and interactive, in-class clicker questions, I taught introductory electromagnetism to life science majors and then to engineering majors. I also wrote several exams for this course including many multiple-choice conceptual questions.

UCSD Physics
Laboratory Teaching
Assistant Coordinator
Sept 2008 – March 2010

This position is primarily for managing TA's who are teaching introductory physics laboratories for engineers in the topics of electronics, waves and optics. Responsibilities included: holding meetings, organizing lab write-up/exam grading, developing criteria for grading lab write-ups, ensuring TAs fulfill obligations, holding a class review lecture and meeting with the professor to discuss and plan the progress of the class.

UCSD Physics
Laboratory Development
June 2008 – Aug 2008

Summer posting to re-write laboratory manuals for introductory physics laboratories for engineers.

UCSD Physics Teaching
Assistant (TA)
Sept 2007 – June 2008

Lecture TA for one trimester for introductory physics for engineers. Laboratory TA for two trimesters for introductory physics laboratories for engineers.

Media and Outreach

Princeton Physics EDI Book Club	Kick-off event was organized and hosted by me with help from Katherine Lamos.
ICHEP2020 Higgs Results	Fermilab news
Physics/Astronomy breakout session for Princeton PhD Preview (P3)	I coordinated/facilitated a two-hour presentation+Q&A session for visiting undergraduate scholars interested in graduate physics and astronomy. I helped review applications and select scholars in a few cases. The intention of this program is to help students from under-represented groups to understand the best techniques for making successful applications to graduate school and encourage students to apply to competitive institutes including Princeton. A few of the students said this was the most useful part of their visit to the university. P3 overview
How to Be an Effective Ally (to women in physics)	I was one of five facilitators of small-group discussions that was centered on scenarios that are typical scenarios that women in physics typically encounter. The objective was to discuss how the community can actively support women before and after these situations happen. Princeton WiP promotion , Event photos
CMS Communication video on Higgs boson searches	In celebration of the sixth anniversary of the discovery of the Higgs boson, a collection of six videos, "Six ways to look at the Higgs Boson", was produced and published by CMS. The fifth installment, " Decay into pairs of b quarks ", was written and performed by me with help from CMS Communications Group and Princeton's Physics staff.
Press Releases on Hbb Observation	Fermilab, Princeton University
Program Director UCSD Young Physicists Program (2008-2010)	This monthly program is a morning of interactive fun for middle and early high school students. The all volunteer crew of UCSD graduate students work with small groups of participants to go through reformatted labs and activities for about 90 minutes. Afterwards there is a short (30-40) minute lecture about a research or physics topic. Pizza is provided at the end. I coordinated the graduate student volunteers, faculty speakers and developed activities for participants for two academic years.

Publications

- [0] CMS Collaboration, "Observation of Higgs Boson Decay to Bottom Quarks", Phys. Rev. Lett. 121 (2018) 121801, arXiv:1808.08242. (More than 300 citations.)
- [1] CMS Collaboration, "Evidence for the Higgs boson decay to a bottom quark-antiquark pair", Phys. Lett. B 780 (2018) 501-532, arxiv:1709.07497. (More than 200 citations.)
- [2] CMS Collaboration, "CMS luminosity measurement for the 2017 data-taking period at $\sqrt{s} = 13$ TeV", CMS-PAS-LUM-17-004, 2018. (More than 95 citations.)
- [3] CMS Collaboration, "CMS Luminosity Measurement for the 2016 Data Taking Period," CMS-PAS-LUM-17-001, 2017. (More than 400 citations.)
- [4] CMS Collaboration, "CMS Luminosity Calibration for the pp Reference Run at 5.02 TeV", CMS-PAS-LUM-16-001, 2016. (More than 40 citations.)
- [5] CMS Collaboration, "CMS Luminosity Measurement for the 2015 Data Taking Period," CMS-PAS-LUM-15-001, 2016. (More than 150 citations.)
- [6] CMS Collaboration, "Observation of the diphoton decay of the Higgs boson and measurement its properties". Eur. Phys. J. C 74 (2014) 3076, arXiv:1407.0558. (More than 770 citations.)
- [7] CMS Collaboration, "Updated measurements of the Higgs boson at 125 GeV in the two photon decay channel." CMS-PAS-HIG-13-001, 2013. (More than 300 citations.)
- [8] CMS Collaboration, "Search for a standard model-like Higgs boson in the $\mu^+\mu^-$ and e^+e^- decay channels at the LHC" Phys. Lett. B 744 (2015) 184, arXiv:1410.6679. (More than 110 citations.)
- [9] CMS Collaboration, "Observation of a new boson at a mass of 125 GeV with the CMS experiment at the LHC," Phys. Lett. B 716 (2012) 30–61, arXiv:1207.7235. (Higgs discovery—more than 16000 citations.)
- [10] CMS Collaboration, "A New Boson with a Mass of 125 GeV Observed with the CMS Experiment at the Large Hadron Collider," Science 338 (2012) 1569–1575, 10.1126/science.1230816. (Higgs discovery—129 citations.)
- [11] CMS Collaboration, "Search for the standard model Higgs boson decaying into two photons in pp collisions at $\sqrt{s} = 7$ TeV," Phys. Lett. B 710 (2012) 403–425, arXiv:1202.1487. (More than 250 citations.)

Conferences and Invited Talks

October 26-30, 2020	“Yukawa session convener” (<i>Higgs 2020</i>).
August 3rd, 2020	“ Higgs Experimental Overview (for ATLAS and CMS) ” (<i>ICHEP 2020</i>).
March 30th, 2020	“Observation of the Higgs boson to bottom quarks” (<i>University of Tennessee - Knoxville</i>).
March 4th, 2020	“Observation of the Higgs boson to bottom quarks” (<i>Boston University</i>).
February 25th, 2020	“Observation of the Higgs boson to bottom quarks” (<i>University of Maryland - College Park Seminar</i>).
February 19th, 2020	“Observation of the Higgs boson to bottom quarks” (<i>Purdue University</i>).
May 2nd, 2019	“ Status of VH ($H \rightarrow b\bar{b}$) at CMS ” (<i>Game of Flavours - CMS Heavy flavour tagging workshop 2019</i>).
March 4th, 2019	“Observation of the Higgs boson to bottom quarks” (<i>University of Alabama</i>).
February 20th, 2019	“Observation of the Higgs boson to bottom quarks” (<i>Michigan State</i>).
January 30th, 2019	“Observation of the Higgs boson to bottom quarks” (<i>University of Minnesota</i>).
December 6th, 2018	“ Observation of the Higgs boson to bottom quarks in CMS ” (<i>Karlsruhe Institute of Technology - Colloquium</i>).
August 31st, 2018	“ Observation of the Higgs boson to bottom quarks ” (<i>Fermilab Wine and Cheese</i>).
July 2018	“ CMS H(125) to bb results ” (<i>Higgs Hunting 2018</i>).
July 2018	“Van der Meer calibration of the CMS luminosity detectors in 2017” (<i>ICHEP 2018</i>).
December 15th, 2017	“Evidence for associated Higgs to bb production at CMS” (<i>Fermilab Wine and Cheese</i>).
August 2016	“Measurements of Higgs boson production and properties in the $b\bar{b}$ decay channel using the CMS detector” (<i>ICHEP 2016</i>).
March 2013	“CMS Measurements of a New Boson in the Gamma Gamma Channel” (<i>LISHEP2013: Workshop on High Energy Physics in the Near Future</i>).
June 2012	“Searches for a Light Higgs with CMS” (<i>Conference on the Intersections of Particle and Nuclear Physics</i>).
Aug 2011	“A Search for the Higgs Boson In $H \rightarrow \gamma\gamma$ Mode” (<i>Meeting of the Division of Particles and Fields of the American Physical Society</i>).